

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Joseph P. Rynd, *et al.*
Application No.: 10/722,929
Filing Date: November 26, 2003
Confirmation No.: 1182
Group Art Unit: 1791
Examiner: Jeffrey Wollschlager
Title: Method Of Forming Thermoplastic Foams Using Nano-
Particles To Control Cell Morphology

Commissioner for Patents
Mail Stop AF
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sirs:

This is a Pre-Appeal Brief Request For Review of the final rejections made in the Office Action mailed on November 20, 2008, and is submitted concurrently with a Notice of Appeal. Upon carefully considering the following comments and the arguments of record (all of which are incorporated herein by reference in their entireties), it is believed that the panel will agree that the Office has acted arbitrarily in making the extant rejection without the requisite substantive evidence.

Regarding the rejection of claims 7 and 8 under 35 U.S.C. §112, second paragraph as being indefinite, Applicants respectfully submit that the transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials and those materials that "do not materially affect the basic and novel characteristics of the claimed invention." (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2111.03). Thus, it is respectfully submitted that claim 1, from which claims 7 and 8 depend, can include additional features, such as, for example, the addition of additives,

so long as they do not materially affect the basic and novel characteristics of the claimed method. Applicants respectfully submit that the additives claimed in claims 7 and 8 are defined in the application at least in paragraph [0023] as additives for improving the processing or modifying the properties of the foam (*e.g.*, fire retardancy). A fire retardant additive is disclosed in paragraph [0031] as one specific example of an additive. It is respectfully submitted that the claimed additives are not deleterious and do not materially affect the basic and novel characteristics of the method claimed in claim 1. As such, Applicants submit that the claimed additives are permissible claimed features and claims 7 and 8 are sufficiently definite.

In separately rejecting claims 1, 8, and 10-15 under 35 U.S.C. §103(a) as being obvious over WO 2001/39954 to Grinshpun, *et al.* ("Grinshpun") in view of U.S. Patent Publication No. 2005/0027040 to Nelson, *et al.* ("Nelson"); claims 1, 8, 10-12, and 14-15 under 35 U.S.C. §103(a) as being obvious Grinshpun in view of U.S. Patent No. 6,589,6456 to Morgenstern ("Morgenstern"); and claims 1, 8, 10-12, 14, 15, and 21 over Grinshpun in view of WO 2003/055804 to Chen, *et al.* ("Chen") and U.S. Patent No. 7,160,929 to Tan ("Tan"), Applicants respectfully submit that the Office has incorrectly interpreted the cited references and has therefore failed to establish proper *prima facie* cases of obviousness.

In particular, Applicants submit that there is no teaching or suggestion within the cited references of a method of manufacturing a rigid foam board as claimed in claims 1 and 21. Grinshpun teaches a foamable composition that is extruded through a die having a plurality of orifices, each of which forms a hollow extrudate. (*See, e.g.*, page 2, lines 19-21 and page 20, lines 22-24). The hollow extrudate is converted into foamed hollow extrudate strands at a temperature that promotes bubble stability. (*See, e.g.*, page 2, lines 22-24 and page 20, lines 26-28). The final step includes permitting the hollow strands to contact and adhere to each other to form a hollow, multi-strand polymer foam extrudate. (*See, e.g.*, page 2, lines 25-28 and page 20, lines 28-31).

Applicants respectfully submit that there is simply no teaching or suggestion of extruding a polymer melt under a second pressure and at a second temperature where the second pressure and second temperature are sufficient to allow the polymer melt to expand and form a foam board as is required in claims 1 and 21. Indeed, the extrusion die in Grinshpun is specifically chosen so that it forms hollow tubes, not a foam board. It is through a coalescing step that the hollow tubes are joined together to form a hollow, multi-strand extrudate. (*See, e.g.*, page 2, lines 14-28 and page 20, lines 28-31 of Grinshpun).

There is simply no teaching or suggestion within Grinshpun of extruding a foam board as claimed in claims 1 and 21. Morgenstern, Nelson, Chen and Tan do not make up for the deficiencies of Grinshpun. Accordingly, it is respectfully submitted that the combination of the teachings of Grinshpun, Morgenstern, Nelson, Chen, and/or Tan would not result in the inventive methods of claims 1 and 21.

In the outstanding final Office Action, it is asserted that the foam sheet produced by the coalescing step is a foam board in accordance with the plain meaning of the term, and as a result, the rejection was maintained. (*See, e.g.*, page 11, lines 3-4 of the Office Action dated November 20, 2008). Applicants respectfully disagree. A “board” may be defined as a “flat piece of wood or similarly rigid material adapted for a special use”. (*See, e.g.*, <http://www.thefreedictionary.com/board>, attached hereto as Attachment A). Foam board insulation is a sheet of rigid foam used in nearly all aspects of building construction to provide thermal resistance. (*See, e.g.*, <http://www.wisegeek.com/what-is-foam-board-insulation.htm>, attached hereto as Attachment B). Accordingly, the term “board” recited in the claims and utilized in the application defines a rigid structure.

As taught at least by Table 1 on page 10 of the application, the foam is extruded by a flat face die/shaper plate or a flat slot die. As one of skill in the art would appreciate, such dies would form solid, rigid foam structures and not hollow tubes as are extruded by the multi-orifice die of Grinshpun. (*See, e.g.*, page 2, lines 19-21 and page 20, lines 22-24 of Grinshpun). It is respectfully submitted that in the present invention, the foam boards of claims 1 and 21 have a rigid foam structure, unlike the hollow tubular structures taught by Grinshpun. Moreover, it is respectfully submitted that the foam “sheet” formed by the coalesced hollow tubes of Grinshpun cannot be a rigid structure, at least partially due to the lack of material within the foam tubes. Indeed, Grinshpun expressly teaches that the hollow foam strands are flexible and compressible. (*See, e.g.*, page 10, lines 17-20). Accordingly, the foam structure of Grinshpun cannot be a rigid foam board as required by independent claims 1 and 21.

In addition, Applicants submit that Grinshpun teaches away from a method of manufacturing a rigid foam board that includes the step of extruding a polymer melt under a second pressure and at a second temperature that allows the polymer melt to expand and form a foam board. As discussed above, Grinshpun specifically teaches the extrusion of a hollow extrudate. (*See, e.g.*, page 2, lines 22-24 and page 20, lines 26-28). As discussed above, a board has a rigid structure. The hollow tubes of Grinshpun are both flexible and

compressible. (*See, e.g.*, page 10, lines 17-20). There is simply no teaching or suggestion within Grinshpun of extruding a rigid foam board. It is therefore respectfully submitted that one of skill in the art reading Grinshpun would be led away from extruding a polymer melt under a second pressure and at a second temperature which permits the polymer melt to expand and form a foam board as is claimed in claims 1 and 21 because Grinshpun fails to teach a rigid structure. As discussed above Morgenstern, Nelson, Chen, and Tan cannot make up for the deficiencies of Grinshpun. As such, it is respectfully submitted that claims 1 and 21 are non-obvious and patentable for this additional reason.

Further, Applicants submit that there is no motivation for one of skill in the art to arrive at the inventions claimed in independent claims 1 and 21 based on the disclosures of Grinshpun, Morgenstern, Nelson, Chen, and/or Tan. As is well established, in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2142). It is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive at a method for manufacturing a rigid foam board based on the teachings of Grinshpun and Nelson because Grinshpun specifically teaches the extrusion of a hollow extrudate. Indeed, Grinshpun teaches away from the methods recited in claims 1 and 21. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

Further, because none of Grinshpun, Morgenstern, Nelson, Chen, and/or Tan teaches or suggests a rigid foam board, Applicants respectfully submit that Grinshpun, Morgenstern, Nelson, Chen, and Tan, alone or in any combination, fail to teach all of the claim limitations set forth in claims 1 and 21. Accordingly, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

With respect to dependent claims 8 and 10-15, Applicants submit that because independent claims 1 and 21 are not taught within Grinshpun, Morgenstern, Nelson, Chen, and/or Tan and claims 8 and 10-15 are dependent upon independent claim 1, dependent

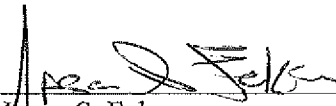
claims 8 and 10-15 are also not taught or suggested by Grinshpun, Morgenstern, Nelson, Chen, and/or Tan.

In response to the rejection of claim 21 under 35 U.S.C. §103(a) as being obvious over Miller in view of Chen and Tan, Applicants respectfully submit that, in order to advance the prosecution of the case and place the claims into condition for allowance, Applicants desire to cancel claim 21 without prejudice.

In summary, Applicants firmly believe that all pending claims are patentably distinguishable over the prior art and should be formally allowed. Upon careful review and consideration it is believed the panel will agree and instruct the Office to issue a Notice of Allowance. Any fees required in connection with this document may be debited to Deposit Account 50-0568.

Respectfully submitted,

Date: 2/13/09



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Attachment B

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What is Foam Board Insulation?

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Foam board insulation is a sheet, usually four by eight feet (1.2 by 2.4 m) in size, of rigid foam used in nearly all aspects of building construction to provide thermal resistance in floors, ceilings and walls. Basically, three materials are used to make foam board: polyurethane, polyisocyanurate and polystyrene.

Polyurethane and polyisocyanurate foam board are very similar in content. The closed-cell foam board is made by first liquefying the pellets, and then introducing a blowing agent. In the case of these two products, the blowing agent is usually one

of the hydro fluoro compounds (HFC) or chloro fluoro carbons (CFC). The blowing agent forms gas bubbles in the mixture when it is heated. The hot, liquefied polyurethane or polyisocyanurate is then forced into a board-shaping dye. After the mixture cools, it is cut into any desired length. The resulting foam board insulation is of higher R (resistance to heat flow) value than a polystyrene foam board, usually R7 or R8 per inch (2.54 cm) of thickness.

Polystyrene foam board insulation is made in much the same way as Polyurethane and polyisocyanurate foam board, except for the differences in expansion. There are two basic types of polystyrene foam board insulation: molded expanded polystyrene (MEPS), and extruded expanded polystyrene (XEPS). The difference in these two types of foam board is the strength of the finished product, though the density, about 1.5 pounds per cubic foot (0.21 kilograms per cubic meter), is usually the same.

MEPS foam board insulation, often called *beadboard*, is made by mixing unexpanded polystyrene pellets or beads containing pentane with a blowing agent. The resulting mixture is poured into a closed container and heated. The heat causes the beads to expand to many times their normal size. The mixture is then poured or injected into a mold, more heat is applied, and the resulting foam blocks are shaped into foam board insulation.

XEPS is made by mixing polystyrene pellets with chemicals to liquefy them. Once a blowing agent is injected into the mixture and it is heated, gas bubbles form, and the hot material is poured into forms. When cool, it is cut into whatever shapes desired. XEPS is stronger than MEPS, having higher compression strength. Because of its greater strength, XEPS foam board insulation is often used for roofs and walls in new construction. The extruded polystyrene also has a higher rating for resistance to moisture.

Both MEPS and XEPS have lower R-values than Polyurethane and polyisocyanurate foam board insulation, rating about R5 per inch (2.54 cm) of thickness.

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board ⁴ (bôrd, bôrd)
n.

1. A long flat slab of sawed lumber; a plank.
 2. A flat piece of wood or similarly rigid material adapted for a special use.
 3. Games A flat surface on which a game is played.
 4. The hard cover of a book.
 5. boards A theater stage.
 6.
 - a. A table, especially one set for serving food.
 - b. Food or meals considered as a whole: *board and lodging*.
 7. A table at which official meetings are held; a council table.
 8. An organized body of administrators or investigators: *a board of trustees; a board of directors*.
 9. An electrical-equipment panel.
 10. Computer Science A circuit board.
 11. Sports
 - a. A scoreboard.
 - b. A tote board.
 - c. boards The wooden structure enclosing an ice hockey rink.
 - d. A diving board.
 - e. A surfboard.
 - f. A snowboard.
 12. Basketball
 - a. A backboard.
 - b. A rebound.
 13. Nautical
 - a. The side of a ship.
 - b. A leeboard.
 - c. A centerboard.
 14. Obsolete A border or an edge.
 15. A usually large, vertically positioned flat surface used for writing or posting, especially:
 - a. A blackboard.
 - b. A bulletin board.
- v. board-ed, board-ing, boards
- v.tr.
1. To cover or close with boards: *board up a broken window*.
 2.
 - a. To furnish with meals in return for pay.
 - b. To house where board is furnished: *board a horse at a stable*.
 3.
 - a. To enter or go aboard (a vehicle or ship).
 - b. To allow (passengers) on board.
 - c. Nautical To come alongside (a ship).
 4. Sports To force (an opposing hockey player) into the boards with a body check.
 5. Obsolete To approach.
- v.intr.
- To receive meals or food and lodging as a paying customer.
- Idioms:**
- across the board**
So as to affect or include all people, classes, or categories: *raised taxes across the board*.
- on board**
1. Aboard.
 2. On the job.

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[Middle English *board*, from Old English.]

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board

Noun

1. a long wide flat piece of sawn timber
2. a smaller flat piece of rigid material for a specific purpose: *ironing board*
3.
 - a. a group of people who officially administer a company, trust, etc.
 - b. any other official group, such as examiners or interviewers
4. a person's meals, provided regularly for money
5. stiff cardboard or similar material, used for the outside covers of a book
6. a flat thin rectangular sheet of composite material, such as chipboard
7. *Naut* the side of a ship
8. a portable surface for indoor games such as chess or backgammon
9. *go by the board* *Informal* to be in disuse, neglected, or lost
10. *on board* on or in a ship, aeroplane, etc.

Verb

1. to go aboard (a train or other vehicle)
2. to attack (a ship) by forcing one's way aboard
3. (foll. by *up*, *in*) etc. to cover with boards
4. to receive meals and lodging in return for money
5. *board out* to arrange for (someone, esp. a child) to receive food and lodging away from home
6. (in ice hockey and box lacrosse) to bodycheck an opponent against the boards

See also **boards** [Old English *bord*]

Collins Essential English Dictionary 2nd Edition 2006 © HarperCollins Publishers 2004, 2006

Board a council convened for business; a number of persons appointed or elected to sit on a committee.

Examples: board of commissioners; of directors, 1712; of governors; of guardians.

Dictionary of Collective Nouns and Group Terms. Copyright 2006 The Gale Group, Inc. All rights reserved.

Thesaurus

Legend: [Synonyms] [Related Words] [Antonyms]

Noun 1. board - a committee having supervisory powers; "the board has seven members"

appeal board, appeals board, board of appeals - a board of officials that are not judicial but are appointed to hear appeals

board of selectmen - a board of officials elected to administer the public business of a New England town

Federal Reserve Board - the seven-member board governing the Federal Reserve System

governing board - a board that manages the affairs of an institution

commission, committee - a special group delegated to consider some matter;

"a committee is a group that keeps minutes and loses hours" - Milton Berle

board of directors, directorate - a group of persons chosen to govern the affairs of a corporation or other large institution

advisory board, planning board - a board appointed to advise the chief administrator

draft board - a board to select personnel for involuntary military service

board of education, school board - a board in charge of local public schools

zoning board - a board of officials who divide an area into zones that are subject to different restrictions

director - member of a board of directors

board member - a member of a governing board

2.

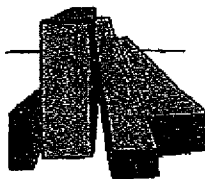
board - a stout length of sawn timber; made in a wide variety of sizes and used for many purposes

plank

matchboard - a board that has a groove cut into one edge and a tongue cut into the other so they fit tightly together (as in a floor)

skid - one of a pair of planks used to make a track for rolling or sliding objects

strake, wale - thick plank forming a ridge along the side of a wooden ship



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lumber, timber - the wood of trees cut and prepared for use as building material

chipboard, hardboard - a cheap hard material made from wood chips that are pressed together and bound with synthetic resin

deal - a plank of softwood (fir or pine board)

knot - a hard cross-grained round piece of wood in a board where a branch emerged; "the saw buckled when it hit a knot"

knothole - a hole in a board where a knot came out

3. **board** - a flat piece of material designed for a special purpose; "he nailed boards across the windows"

aquaplane - a board that is pulled by a speedboat as a person stands on it and skims over the top of the water

bread board, breadboard - a wooden or plastic board on which dough is kneaded or bread is sliced

notice board, bulletin board - a board that hangs on a wall; displays announcements

chopping board, cutting board - a wooden board where meats or vegetables can be cut

drafting board, drawing board - a smooth board on which paper is placed for making drawings

drainboard, draining board - a board beside a kitchen sink and inclined to drain into the sink

floor board, floorboard - a board in the floor

ironing board - narrow padded board on collapsible supports; used for ironing clothes

kneeler - a board (sometimes cushioned) for someone to kneel on

mortarboard, hawk - a square board with a handle underneath; used by masons to hold or carry mortar

palette, pallet - board that provides a flat surface on which artists mix paints and the range of colors used

planchette - a triangular board supported on casters; when lightly touched with the fingertips it is supposed to spell out supernatural (or unconscious) messages

scoreboard - a large board for displaying the score of a contest (and some other information)

flat solid, sheet - a flat artifact that is thin relative to its length and width

sideboard - a board that forms part of the side of a bed or crib

sideboard - a removable board fitted on the side of a wagon to increase its capacity

skateboard - a board with wheels that is ridden in a standing or crouching position and propelled by foot

snowboard - a board that resembles a broad ski or a small surfboard; used in a standing position to slide down snow-covered slopes

springboard - a flexible board for jumping upward

surfboard - a narrow buoyant board for riding surf

trencher - a wooden board or platter on which food is served or carved

wake board, wakeboard - a buoyant board (resembling a surfboard) that is used to ride over water while being pulled behind a motorboat

dry wall, drywall, wallboard - a wide flat board used to cover walls or partitions; made from plaster or wood pulp or other materials and used primarily to form the interior walls of houses

work-board, workboard - a horizontal board that provides a supported surface for manual work

4. **board** - food or meals in general; "she sets a fine table"; "room and board"

table

fare - the food and drink that are regularly served or consumed

training table - planned meals for athletes in training (usually served in a mess hall)

5. **board** - a vertical surface on which information can be displayed to public view

display board, display panel

big board - the large display board at the New York Stock Exchange that reports on stocks traded on the exchange

video display, display - an electronic device that represents information in visual form



6. **board** - a table at which meals are served; "he helped her clear the dining table"; "a feast was spread upon the board"



dining table

dining-room table - dining-room furniture consisting of a table on which meals can be served

dinner table - the dining table where dinner is served and eaten

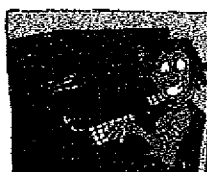
high table - a dining table in a dining-hall raised on a platform; seats are reserved for distinguished persons

refectory table - a long narrow dining table supported by a stretcher between two trestles

table - a piece of furniture with tableware for a meal laid out on it; "I reserved a table at my favorite restaurant"

triclinium - a dining table with couches along three sides in ancient Rome

7. **board** - electrical device consisting of a flat insulated surface that contains switches and dials and meters for controlling other electrical devices; "he checked the instrument panel"; "suddenly the board lit up like a Christmas tree"



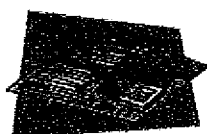
control board, control panel, instrument panel, panel

dashboard, fascia - instrument panel on an automobile or airplane containing dials and controls

electrical device - a device that produces or is powered by electricity

idiot light - a colored warning light on an instrument panel (as for low oil pressure)

8. **board** - a printed circuit that can be inserted into expansion slots in a computer to increase the computer's capabilities



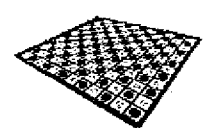
add-in, circuit board, circuit card, plug-in, card

CPU board, mother board - the main circuit board for a computer

PC board - a removable circuit board for a personal computer; fits into a slot in the mother board

printed circuit - computer circuit consisting of an electronic sub-assembly; copper conductors are laminated on an insulating board or card and circuit components are inserted into holes and dip soldered

9. **board** - a flat portable surface (usually rectangular) designed for board games; "he got out the board and set up the pieces"



gameboard

backgammon board - the board on which backgammon is played

checker board, checkerboard - a board having 64 squares of two alternating colors

cribbage board - a board with pegs and regularly spaced holes for holding the pegs; used for keeping the score in a game of cribbage

dart board, dartboard - a circular board of wood or cork used as the target in the game of darts

go board - a board used for playing go

monopoly board - a board used for playing monopoly

Ouija, Ouija board - a board with the alphabet on it; used with a planchette to spell out supernatural messages

pegboard - a board perforated with regularly spaced holes into which pegs can be fitted

punchboard - a small board full of holes; each hole contains a slip of paper with symbols printed on it; a gambler pays a small sum for the privilege of pushing out a slip in the hope of obtaining one that entitles him to a prize

surface - the outer boundary of an artifact or a material layer constituting or resembling such a boundary; "there is a special cleaner for these surfaces"; "the cloth had a pattern of red dots on a white surface"

- Verb 1. **board** - get on board of (trains, buses, ships, aircraft, etc.)

get on

embark, ship - go on board

entrain - board a train

come in, enter, get in, go in, go into, move into, get into - to come or go into; "the boat entered an area of shallow marshes"

catch - reach in time; "I have to catch a train at 7 o'clock"

2. **board** - live and take one's meals at or in; "she rooms in an old boarding house"

room

inhabit, live, populate, dwell - inhabit or live in; be an inhabitant of; "People lived in Africa millions of years ago"; "The people inhabited the islands that"

are now deserted"; "this kind of fish dwells near the bottom of the ocean";
"deer are populating the woods"

3. board - lodge and take meals (at)

habituate, use - take or consume (regularly or habitually); "She uses drugs rarely"

board - provide food and lodging (for); "The old lady is boarding three men"

4. board - provide food and lodging (for); "The old lady is boarding three men"

board - lodge and take meals (at)

live in, sleep in - live in the house where one works; "our babysitter lives in, as it is too far to commute for her"

cater, ply, provide, supply - give what is desired or needed, especially support, food or sustenance; "The hostess provided lunch for all the guests"

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board

noun 1. **PLANK, panel, timber, slat**, piece of timber

noun 2. **COUNCIL**, directors, **committee, congress, ministry**, advisers, **panel, assembly, chamber, trustees**, governing body, **synod, directorate, quango**, advisory group, **conclave**

noun 3. **MEALS, provisions, victuals**, daily meals

verb 4. **GET ON, enter, mount, embark, entrain, embus, enplane** << **OPPOSITE** get off

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Translations

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board

n board [bo:d]

1 a strip of timber *The floorboards of the old house were rotten.*

2 a flat piece of wood etc for a special purpose *notice-board; chessboard.*

3 meals *board and lodging.*

4 an official group of persons administering an organization etc *the board of directors.*

v

1 to enter, or get on to (a vehicle, ship, plane etc) *This is where we board the bus.*

2 to live temporarily and take meals (in someone else's house) *He boards at Mrs Smith's during the week.*

n 'boarder

a person who temporarily lives, and takes his meals, in someone else's house.

n 'boarding-house

a house where people live and take meals as paying guests.

n 'boarding-school

a school which provides accommodation and food as well as instruction.

also adj across the board

an across-the-board increase.

go by the board

to be abandoned *All my plans went by the board when I lost my job.*

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References in classic literature

Besides, the **board** made periodical pilgrimages to the farm, and always sent the beadle the day before, to say they were going.
[Oliver Twist Or The Parish Boy's Progress](#) by Dickens, Charles

[View in context](#)

"One gets jolly good dinners on **board** these ships," remarked one of our band.

[Falk - A Reminiscence](#) by Conrad, Joseph [View in context](#)

I was among the number, but when after strolling about for some time we lighted a fire and sat down to enjoy the repast which we had brought with us, we were startled by a sudden and violent trembling of the island, while at the same moment those left upon the ship set up an outcry bidding us come on **board** for our lives, since what we had taken for an island was nothing but the back of a sleeping whale.

[The Arabian Nights](#) by Lang, Andrew [View in context](#)

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